

(5.6) Connecting Standard and Vertex Forms

$y = ax^2 + bx + c$ $y = a(x-h)^2 + k$

1) $y = (x-3)^2 + 10$ Vertex: (,)

$a =$
 $b =$ ****look for patterns****

2) $y = 2(x+4)^2 - 5$ Vertex: (,)

$a =$
 $b =$

3) $y = 3(x-1)^2 + 12$ Vertex: (,)

$a =$
 $b =$

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(5.6) Connecting Standard and Vertex Forms

$y = ax^2 + bx + c$ $y = a(x-h)^2 + k$

1) $y = (x-3)^2 + 10$
 $y = (x^2 - 3x + 9) + 10$
 $y = x^2 - 6x + 19$ Vertex: (3, 10)

$a = 1$
 $b = -6$ ****look for patterns****

2) $y = 2(x+4)^2 - 5$
 $y = 2(x^2 + 8x + 16) - 5$
 $y = 2x^2 + 16x + 32 - 5$
 $y = 2x^2 + 16x + 27$ Vertex: (-4, -5)

$a = 2$
 $b = 16$ $-\frac{b}{2a} = \frac{-16}{2(2)} = -4$
X Vertex

3) $y = 3(x-1)^2 + 12$ Vertex: (1, 12)

$y = 3(x^2 - 2x + 1) + 12$
 $y = 3x^2 - 6x + 3 + 12$
 $y = 3x^2 - 6x + 15$

$a = 3$
 $b = -6$ $-\frac{b}{2a} = \frac{-(-6)}{2(3)} = \frac{6}{6} = 1$
Sub k=1 y=12

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To find the x-coordinate of the vertex from standard form:

$x = \frac{-b}{2a}$

Find the vertex of:

a) $y = x^2 + 6x + 8$ ***2 ways***

Factor first: New way:

b) $y = 2x^2 + 8x - 11$

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To find the x-coordinate of the vertex from standard form:

$x = \frac{-b}{2a}$

Find the vertex of:

a) $y = x^2 + 6x + 8$ $x = \frac{-6}{2(1)} = -3$
Factor first: $y = (x+4)(x+2)$ Zeros are -4 and -2
 $x = -4$ and $x = -2$ Same $x = -3$
 $y = (-3)^2 + 6(-3) + 8 = 9 - 18 + 8 = -1$ $\therefore V(-3, -1)$

b) $y = 2x^2 + 8x - 11$ * DOES NOT FACTOR
 $x = \frac{-8}{2(2)} = -2$ $y = 2(-2)^2 + 8(-2) - 11 = 8 - 16 - 11 = -19$
 $\therefore V(-2, -19)$

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Second Technique Partial Factor To find the x-coordinate of the vertex from standard form:

Find the vertex of:

Factor first: ***2 ways*** New way:

b) $y = x^2 + 6x + 8$

b) $y = 2x^2 + 8x - 11$

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Second Technique Partial Factor To find the x-coordinate of the vertex from standard form:

Find the vertex of:

a) $y = x^2 + 6x + 8$ $y = (x+4)(x+2)$ Zeros are -4 and -2
 $x = -4$ and $x = -2$ Same $x = -3$
 $y = (-3)^2 + 6(-3) + 8 = 9 - 18 + 8 = -1$ $\therefore V(-3, -1)$

b) $y = 2x^2 + 8x - 11$ * DOES NOT FACTOR
 $x = \frac{-8}{2(2)} = -2$ $y = 2(-2)^2 + 8(-2) - 11 = 8 - 16 - 11 = -19$
 $\therefore V(-2, -19)$

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Review Ques
Word Problems
p. 294 q. 11& 13

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Homework
p.301 and 302
q.2,3,5 a,c,f, 7 a,c,e & 11

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